Nunez Community College
Master Syllabus

CHEM 1100: General Chemistry I Lecture

Division:	Health and Natural Science Division
Last Revised:	February 20, 2008
Contact Information:	Elsa Winsor

EVALUATION OF INSTRUCTION

Each class at the College is evaluated by the students during the semester. The instrument used allows students to comment on the instructor and his presentation of the course. The results of these evaluations are made available to the instructor after grades are complete and turned in to the Division.

The Dean of the Division or his designee visits classes to observe instructors and completes an evaluation. A copy is given to the instructor with the opportunity for the instructor to respond to the evaluation. The evaluation with the instructor's response is kept on file in the Dean's office.

COURSE DESCRIPTION:

CHEM 1100 General Chemistry I (3-0-3). This introduces the fundamentals of chemistry to include properties of matter, structure of elements and compounds, laws, theories, general principles, and problem solving techniques. Prerequisites: eligibility for enrollment in MATH 1180. All developmental courses in reading should be complete.

REQUIRED MATERIALS

Text: Chang, Raymond. 2007. *Chemistry, Ninth Edition*. McGraw-Hill, New York, NY. *(ISBN: 9780073301709)*

STUDENT LEARNING OUTCOMES

It is the goal of this course that the student comprehends major concepts in chemistry. Upon completion of this course, the student will be able to:

1. Have a basic understanding of the nature of science, the scientific attitude and the various branches of science. Understand the difference between science and technology.
2. Know the classifications of matter and understand physical and chemical properties of matter and know the difference between physical and chemical changes.
3. Know the SI units of measurement and the prefixes used with these units.
4. Handle very large and very small numbers by using scientific notation. Understand the concept of significant figures and be able to use them correctly.
5. Use dimensional analysis in solving problems.
6. Understand the structure of the atom and the concepts of atomic number, mass number, and isotopes.
7. Be thoroughly familiar with the structure of the periodic table and how it is related to the structure and characteristics of the elements.
8. Understand molecules and ions and be able to give names and formulas of elements, compounds, and ions.
9. Know how to calculate the molecular mass of a molecule and the percent composition of each element in the compound.
10. Understand the concepts of a mole and of Avogadro's number and be able to do calculations

involving these quantities.
11. Write correct, balanced chemical equations.
12. Understand the concepts of electrolytes and nonelectrolytes in aqueous solutions. Understand and be able to do equations for the major types of chemical reactions that take place in aqueous solution: precipitation, acid-base, and oxidation-reduction reactions.
13. Understand the ideal gas laws and be able to do calculations involving these laws.
14. Understand the concept of energy and the principal forms of energy.
15. Know the difference between heat and temperature. Understand exothermic and endothermic reactions.
16. Understand Enthalpy and the First Law of Thermodynamics. Work problems with thermochemical equations.
17. Understand the basics of quantum mechanics and the shapes of the s, p, and d orbitals and how to figure how many of each type of orbital a given atom has.
18. Understand the periodic relationships between elements and what position in the periodic table shows about relative physical and chemical properties of each atom.
19. Know the different groups of chemical elements and their properties.
20. Know the difference between ionic and covalent bonds and understand polar covalent bonds.
21. Understand single, double, and triple bonding. Be able to write Lewis dot symbols for valence electrons and for chemical bonding. Understand and be able to apply the octet rule.
22. Know the different forms of valence shell hybridization. Understand the VESPR model for predicting molecular geometry
23. Understand intermolecular forces involved in interactions in the liquid and solid states. Understand hydrogen-bonding and how, when, and why it occurs.
24. Appreciate the importance of the physical structures of water in relation to its chemical and physical properties and the importance of this compound in so many aspects of the earth and the living and non-living things on the planet.
25. Understand the energy changes that accompany changes of state involving liquids, solids, and gases.
26. Understand the terms solution, solvent, solute, saturated, unsaturated, and supersaturated solutions.
27. Know and be able to do calculations involving various methods of expressing concentration: percent by mass, mole fraction, molarity, and molality.
28. Understand the process and purposes of distillation.
29. Understand how solutes can affect freezing points and boiling points of liquids.
30. Understand the colligative properties of electrolyte and nonelectrolyte solutions.

REQUIREMENTS FOR SUCCESSFUL COMPLETION

Four lecture examinations will be given during the semester. They are equally weighted and are not cumulative; one grade may be dropped. The examinations will cover the lecture material in great detail and the assigned reading from the texts. NO MAKE-UP EXAMINATIONS WILL BE GIVEN.

Daily quizzes will include readings from the text and material from previous lectures not yet covered on the major examinations. Questions from the text will be based on the pages assigned for the previous week and on material covered since the most recent major examination.

CONTENT OUTLINE

Chapter	**Topic**	Class
1	Chemistry: The Study of Change	1-2
2	Atoms, Molecules, and Ions	3-4
3	Mass Relationships in Chemical Reactions	5-6
	Exam I	7
4	Reactions in Aqueous Solutions	8-9

5	Gases	10-11
6	Thermochemistry	12-13
	Exam II	14
7	Quantum Theory and the Electronic Structure of Atoms	15-16
8	Periodic Relationships Among the Elements	17-18
9	Chemical Bonding I: Basic Concepts	19-21
	Exam III	22
10	Chemical Bonding II: Molecular Geometry and Hybridization of Atomic Orbitals	23-24
11	Intermolecular Forces and Liquids and Solids	25-26

GRADING

The grading scale used will be: A = 90-100%, B = 80-89%, C = 65-79%, D = 50-64%, and F = 0-49%. It is anticipated that the total number of points possible will be distributed as follows:

Lecture examinations (100 points each)	300
Quizzes and other assignments	200
Total	500

ATTENDANCE

Students should read the policy on attendance in the Nunez College Catalog. Roll will be checked each class and the instructor will drop a student for excessive unexcused absences prior to the official last day to drop a course. If the instructor drops a student from the roster before the last drop date, the student will receive a "W" grade. If absences occur and/or accumulate after the last day to officially withdraw, the student will fail the course.

CLASSROOM ETIQUETTE

1. No food or drinks are allowed in class.
2. All cell phones must be turned off prior to entering class.
3. No children are allowed in class.
4. All assignments must be turned in complete and on time. There are no make-ups.

PLAGIARISM AND CHEATING

Cheating/plagiarizing is a serious offense. Webster defines plagiarism as the act of "taking and using as one's own the ideas or writings of another." Depending on the frequency or severity of a student's cheating/plagiarizing the instructor may lower the student's grade or recommend the student to the Vice Chancellor for Academic Affairs for disciplinary action.

AMERICANS WITH DISABILITIES ACT

It is the policy of Nunez Community College to accommodate students with disabilities, pursuant to federal law, state law, and the school's commitment to equal educational opportunities. Any student with a disability who needs accommodations should contact Carly Gervais in the ADA Coordinator's Office. The office is located in the Law Library, Room 1-234, telephone 278-7491 or e-mail cgervais@nunez.edu.